



THRIVING WHEN THE GRID IS DOWN

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Thriving when the grid is down

Every community is at risk of experiencing a blackout, from the short 15 min power outages to widespread blackouts that can last for days or even weeks. Every home in every region can experience a blackout, and while these events are usually a minor, short-term inconvenience, widespread power outages can quickly become an emergency situation. By preparing yourself ahead of time, however, you can avoid most of the pitfalls that people experience during a blackout.

What causes Blackouts?

Blackouts can occur for many reasons. Earthquakes, fires, hurricanes, and severe thunderstorms are all possibilities, as are wildfires and extreme temperatures. Man-made reasons include forced blackouts to prevent damage or to divert power. Aged and outdated power grids can also easily become overwhelmed from increased power usage, usually when homes and businesses increase their use of heating or cooling systems.

Natural Causes

- ❑ Earthquakes: Strong earthquakes can damage power lines and cripple the grid system, leading to widespread power outages.
- ❑ Extreme temperatures: During a severe heat wave or cold snap, extreme temperatures drive people to crank up the heat or AC, which then drains the power grid of electricity. In many cases, the utility companies are forced to implement rolling blackouts of businesses or neighborhoods to save power and take the strain off the system.
- ❑ Severe storms: Tornadoes, hurricanes and severe thunderstorms can all cause widespread power failure. Lightning can cause damage to electronics, while high winds can snap power lines and damage power plants.
- ❑ Flooding: Whether caused by rain, a tsunami or storm surge, flooding is a dangerous natural event that can wreak havoc on the electrical grid system, leaving some areas without power for days at a time.
- ❑ Space Weather: Commonly overlooked by much of the public, space weather, such solar flares or coronal mass ejections (CME) from our sun can effectively shut down the world's power grid systems. While most of these events are small and cause little, if any, electrical disturbance, much stronger flares and ejections are possible and can cause considerable damage.

Human Causes

- ❑ Rolling blackouts: Usually caused by severe weather or extreme temperatures, rolling blackouts can also be imposed by the utility company for scheduled maintenance or repairs.

Rolling blackouts are generally done to take the strain off of an over-taxed grid system. While inconvenient, rolling blackouts tend to only last a few minutes to several hours and are simple to deal with. Most utility companies announce rolling blackouts online and on public radio stations.

- EMP: Electro-magnetic-pulse (EMP) generally refers to the solar storms that can cause blackouts, but also refers to a type of weapon used to disable all electronics within a strike area. Powerful and effective, these weapons can actually power equipment that isn't plugged in at times, though usually they fry up all electronics beyond repair. Fortunately, this kind of advanced equipment is not widely available and is used almost exclusively by the military.

What to Do

Blackouts lasting 0-24 hours

Power outages that last less than a day are generally easy to deal with. For most people, these blackouts are a curiosity and an inconvenience. Many stores and other public places may be up and running with the use of generators. Whether the blackout you experience is expected to last a day or a month, below are some of the first steps to take:

1. Identify the cause: Blackouts have many different causes, and it's important to know why your community is experiencing a power outage. Scheduled rolling blackouts are usually no problem, but sudden blackouts from bad weather or a power grid failure can be more longterm and serious.
2. Get home: Unless this is part of a short rolling blackout, try to get your family together and back home quickly, stopping only for necessities. Your home is your safe spot
3. Get cash: When the power goes out, that means the majority of ATMs and credit card machines won't work. If any stores are open, there's a good chance that they'll only take cash. Try and get as much cash as you can from the bank or a working ATM.
4. Unplug everything: When the power does turn back on, it may cause power surges, which can cripple your electronics.
5. Fill the tub: Unless this is a short, scheduled blackout, there's a good chance that water will fail or be deemed unsafe. By filling your bathtub, jugs and other containers with water, you can ensure access to drinking water for at least several days.
6. Do not call 911 except for a life-threatening emergency. Also do not make phone calls unless you absolutely must to stay safe – calling friends and relatives to check in overwhelms cell phone towers and phone lines, leaving those in a dire emergency unable to contact for help. If you must, send a text rather than make a phone call.
7. Leave the refrigerator/freezer closed

Blackouts lasting 1-7 days

Power outages that last more than a day are almost always due to severe weather or natural disaster. Blackouts lasting more than a day also tend to be more common in rural or outlying areas, so there's a chance that the power companies have not finished restoring power yet. If your power outage lasts

more than a day, continue to follow the guidelines above by keeping phone use to a minimum and leaving the fridge and freezer shut. Blackouts rarely last for more than a few days, so don't panic. Stay indoors unless you must go out for supplies. Traffic lights will probably not work, making driving difficult and more dangerous than usual.

- ❑ Tap into your water heater for additional drinking water (as long as it's cool enough of course)
- ❑ Consider evacuating to another location with power, especially if it's extremely cold or hot outside, or staying home becomes too uncomfortable. During the heat of the day, many public places, such as movie theaters, community centers and shopping malls can serve as heating or cooling shelters.

Blackouts lasting 1-4+ weeks

Power outages lasting for more than a few days are fairly rare, but they do happen. Long-term blackouts are likely from very severe weather, a serious natural disaster or from a powerful solar storm. If severe weather is persistent and you live in a rural area, it's possible for power to remain off for two or three weeks. If you haven't already, it may be a good idea to consider evacuating to somewhere with power. Other problems, such as water purity, personal safety and hygiene become more apparent if the blackout lasts for more than a week.

Being Prepared

A widespread or long-lasting blackout is a disaster, and like most disasters, the best way to survive in safety and comfort depends on being prepared ahead of time. Remember, blackouts can occur at any time, day or night, and in any kind of weather.

Emergency Kit

An emergency kit is a must for every home. Including necessities such as first-aid, extra food and flashlights, emergency kits are easy to put together and can be tailor-made for your climate and family. For more information, the American Red Cross offers a [power outage checklist](#). Below is a general guide to help get you started:

- ❑ Emergency plan: Every emergency kit should have a copy of your family's emergency plan, which should cover details like a meeting place, evacuation options and what to do with family pets during an emergency. Write out and discuss a solid plan with your family, and rehearse it at least once every year.
- ❑ First-Aid kit: First-Aid kits can be large and elaborate or small and simple. You can make your own kit or can buy one of the many pre-made emergency kits available at most drug stores. A basic first-aid kit should include antibiotic ointment, bandages and bandage strips, medical tape, safety pins, assorted sizes of gauze pads, hand sanitizer, scissors and saline solution.
- ❑ At least one sleeping bag and/or blanket per family member. More bedding may be required in cold climates.

- ☐ At least 3 days of nonperishable food per family member (including your pets!). Many experts recommend storing 2 weeks worth of food if you can.
- ☐ Extra batteries: Be sure to properly store all batteries and inspect them periodically for any sign of damage.
- ☐ Portable am/fm short-wave radio: These can be both battery powered or hand-cranked, and will be your lifeline in the event of a mass power outage. Make sure you know which stations to turn into for news and weather.
- ☐ Bottled or clean water kept in a sealed container: You should store at least 3 days' worth of water for every family member. Remember, your pets need drinking water too.
- ☐ Ice
- ☐ Cooler: During winter in cold climates, a cooler packed with snow can help keep perishables from spoiling.
- ☐ Lighters, matches etc. in a waterproof container.
- ☐ Pocket knife/hunting knife
- ☐ Flashlights: Keep at least one per family member with extra batteries. LED lanterns and flashlights are brighter and last longer on batteries than standard incandescent light bulbs... There are also affordable and handy “puck lights” available that are usually used to light up the inside of cabinets, but that are very useful for lighting up hallways, stairways, etc.
- ☐ Candles: Candles are the tried and true method of lighting the home during a blackout, and it can be handy to have at least a few stashed away with some matches just in case. However, both the American Red Cross and the Federal Emergency Management Agency (FEMA) recommend using candles due to the increased fire risk. Their caution is justified, as fires are very common during a power outage.
- ☐ Cash: The ATMs will be down without power, and many banks may be closed. When this happens, any stores that remain open will be cash-only. Consider stashing at least \$500 cash in small bills to use in the event of a power outage.
- ☐ Household bleach: Bleach can be used as a disinfectant, and can even treat water for safe drinking. It takes 16 drops of household bleach to treat one gallon of water.
- ☐ Books, cards and games to help stave off boredom
- ☐ Change of clothing, including sweaters and thermal underwear in cold climates
- ☐ Personal hygiene items, including feminine supplies, waterless shampoo, soaps, wipes and hand sanitizer.
- ☐ Extra medication, if possible
- ☐ At least 3 days worth of baby supplies, including diapers, bottles, clothes and formula.

Other Preparedness Tips

- ☐ Get into the habit of filling up your gas tank. Try and keep it at least half- full in case your community loses electricity and the gas stations can't pump gas.

- ❑ Keep extra bags of ice, or even zip-loc bags full of frozen water, in your freezer. This will help your freezer stay colder longer, and can even serve as an emergency ration of drinking water once the ice melts.
- ❑ If you or a family member is on life support or needs other power-dependent medical equipment, call you utility companies. Most companies keep a list of homes that require power for life-support and call everyone on that list long before a scheduled rolling blackout occurs.

Getting Backup

With events like the great power outage in 2003, and problems in infrastructure like the US's outdated and already overburdened power grid, the threat of a widespread blackout is very real. Avoiding the worst effects of a power outage can mean the difference between struggling and thriving, and can be made possible simply by having some backup set up ahead of time. So before the lights get shut off, it's a good idea to invest in some sustainable backup power that you can count on.

Gas Generator: A gas generator can be a literal life saver in the event of a power outage, giving you access to your very own electricity for lights, heating, electronics and cooling. Generators can be dangerous though, so it's important to get advice from a professional if you have never installed or used a generator yourself before. Before purchasing a gas generator, make sure to check your state or city air quality codes – you may have to acquire a permit.

If you don't have a generator, consider getting a power inverter, which can turn DC electric power into AC electric power, allowing you to turn your own car into a makeshift generator..

Fire: Fire provides both heat and light, and if you're fortunate to have a wood-burning stove or fireplace, then you can use this resource to its full potential. Able to heat up the home as well as provide an excellent means for cooking, fire can help ensure that your family can stay warm and enjoy a nourishing warm meal. Just be careful – a lit fireplace or indoors can be hazardous.

Solar Power: Having solar power during a blackout can be very useful. Thanks to new technology, solar panels are more efficient and can be purchased relatively cheap. Many homeowners are investing in solar water heaters, while others are buying a simple panel or two to help power the lights or electronics. Not needing anything other than bright sunlight, solar panels can continue to give power long after generators run out of fuel. If you already have a solar panel installed, follow [FEMA's energy conservation guidelines](#) to make sure you get the most out of available power.

For cheap lighting at night, consider investing in a small set of solar-powered outdoor garden lights. During a blackout, you can put them outside to charge by day, and then bring them in for light at night. Not only is this essentially “free” power for light, it also allows you to conserve on batteries for your lanterns and flashlights.

Staying Safe

Power lines: During a power outage, many people can be killed by wandering too close to damaged power lines. Remember, just because you don't have power, does not mean that all power lines are "dead." Stay away from downed power lines during a blackout.

Spoiled food: Food left in a refrigerator can spoil in a matter of hours. During a blackout, keep the fridge and freezer door closed at all times unless absolutely necessary. If the blackout may last a while, cook and eat all perishable food first to avoid wasting it. Throw away any food that's been left out in temperatures 40F for more than two hours. As long as the freezer remains below 40F and the ice has not completely thawed, the food should be safe. However, if any food smells or looks strange, or that you doubt at all, throw it out.

Freezing: Hypothermia, or dangerously low body temperature, is a serious concern if you experience a power outage during the winter. To prevent freezing, bundle up with extra layers of clothing, including thick wool socks and a hat to keep body heat in. If you have alternate heating power, go ahead and use it, but remember that burning coal, propane burners and open fire indoors can be very dangerous.

Overheating: Hyperthermia, or dangerously high body temperature, is another concern during a blackout, especially during the heat of summer. In fact, overheating kills more people in the US every year than tornadoes, hurricanes, lightning and earthquakes combined. Make sure to stay hydrated, and avoid any strenuous activity.

Pet safety: It's easy for some to overlook their animals during a disaster, but their needs must be met as well. In advance, make sure your pets are microchipped and have up-to-date ID tags. During a disaster, it's important to keep them under your control at all times. Also, if your animal got loose, confused or frightened, they could bolt, and during a power outage, there are few resources available to help track down lost pets. Your pets are also likely to suffer from hypothermia or overheating in extreme temperatures, so keep an eye on them and make sure they always have access to fresh water and a safe place to escape the heat or cold.

Looting: During a widespread blackout, unprepared people may become desperate, and desperate people do desperate things. In addition, some hooligans may try to take advantage of law enforcement being stretched thin. Both looting and vandalism are common during blackouts, especially at night, and can begin within days of a widespread power outage. It's best to keep a low profile and not advertise that you have power by turning on too many lights at night.

Fire: Many people choose to carry extra candles in their home in case of a power outage. If you choose to use candles as well, *be careful!* Candles carry the risk of fire, and the American Red Cross recommends against using candles for this very reason. Use your candles responsibly by... and never leave a burning candle unattended, even for a few minutes.

Carbon monoxide: Carbon monoxide (CO) is an odorless gas that can be fatal to people and animals. It's released by combustion, and so is most likely a problem from burning fire, coal or gas indoors. It can kill very quickly, so it's important to invest in a carbon monoxide detector for your home. During a blackout, never burn coal or wood, and never use your generator, grill or portable gas stove indoors.

The Nation's Largest Blackout

On August 14, 2003, the largest power outage in US history took place, leaving much of the Northeast without power. The result left about 50 million people without power, including 800 people trapped in elevators and 340,000 trapped in subways. The power outage lasted up to a couple days in some areas. In the end, this power outage caused more than \$6 billion in damage and 11 deaths.

Amazingly, this historical power outage was not caused by severe weather, but by a bug in the system at a control plant in Ohio. The bug prevented the grid system from alerting engineers that transmission lines were overloaded. When those lines hit a tree branch, it resulted in a widespread power failure. Though it did not last very long, this blackout sparked alarm in residents, including many who began to doubt the US electrical grid system.

Stories of historical events like the Northeast blackout of 2003 are a sobering reminder of the vulnerability of our nation's power grid system, and the difficulties that widespread power loss can cause. While our current power grid has many safeguards in place, no one can determine when or where a natural disaster will strike and cripple the grid system. Like most emergencies or disasters, it's best to prepare for a blackout well in advance. Doing so will allow you and your household to not only survive, but live comfortably until electricity is restored.

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